Note on Cosalite, Alaskaite and Beegerite. By George A. Koenig.

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The discovery of another rich vein of Bismuth silver ore in Ouray Co., Colorado, last spring, has developed new interest in the sulphobismuthite minerals. The new discovery is called "Gladiator," and is situated, according to Mr. Stockder, my correspondent, at the mouth of Poughkeepsie gulch into the Uncompaghre valley. The "Alaska" is situated at the head of this gulch, some six or eight miles above the Gladiator.

My esteemed friend and colleague, Prof. F. A. Genth, examined some specimens of the new find, whilst others awaited my return from Europe.

In connection with this investigation, Dr. Genth also analyzed material from a specimen, which I had given him as "Alaskaite" from the Alaska mine. The results of his analysis did not agree with the composition of alaskaite, as found by me, but rather with cosalite. To make doubly sure, he kindly asked me to repeat the analysis with well selected material from the same specimen. I did so with the following result:

Bi	=	43.54
Pb	=	26.77
Ag	=	1.35
Cu	=	8.78
Fe	=	0.52
Zn	=	trace
Sb	=	undet.
S	=	17.13
Insoluble	=	0.60
		98.69

Particles of chalcopyrite could not be excluded in picking. It we deduct the iron, with a corresponding quantity of copper and sulphur as chalcopyrite, we have

Bi	=	43.54 : 210	=	0.2007
Pb	=	26.77 : 206.4	=	0.1298
Ag	=	1.35 : 215.3	=	0.0065
Cu	=	8.22 : 129.6	=	0.0673
				0.2036
S	=	16.54 : 32	=	0.5169
(Pb, Ag_2, Cu_2) : Bi : S			=	1.01 : 1 : 2.57

or 2 RS + $Bi_2 S_3$ = Cosalite.

Although I had used the same methods in the analysis of alaskaite, I felt induced to reëxamine my type specimens of that species. Upon closer examination the difference in color between this cosalite and the alaskaite becomes unmistakable. Still I might have been mistaken. The material was picked with much care, more than in my first examination, as will be seen by comparison of the results. It was scarce in conse-

quence, and one-half gram only was used for each analysis. Of one analysis all but the lead determination was lost.

After separating Pb and Bi by dilute sulphuric acid and weighing the first as $PbSO_4$, the latter was dissolved in NaHO, and if a residue remained, it was dissolved in NHO_3 evaporated with dil. H_2SO_4, and thus a complete separation of Bi and Pb effected. Bi was weighed as BiClO.

The spec. gravity of 1.014 gr. was found = 6.782.

The analysis gave :

Bi	=	53.39	
Pb	=	12.02	(mean of 11.88 + 12.16)
Ag	=	7.80	
Cu	=	5.11	
Fe	=	0.84	
Zn	=	0.34	
S	=	17.98	
Sb	=	undet.	
Insoluble	=	1.80	
		99.16	

If we deduct again 0.84 Fe + 0.95 Cu + 0.94 S as chalcopyrite, we have as belonging to the light gray mineral :

Bi	=	53.39 : 210	=		0.2542
Pb	=	12.02 : 206.4	=	0.0582	0.1317
Cu	=	4.16 : 129.6	=	0.0321	
Ag	=	7.80 : 215.3	=	0.0362	
Zn	=	0.34 : 64.9	=	0.0052	
S	=	17.04 : 32	=		0.5330

R : Bi : S = 1 : 1.93 : 4.05

that is (Pb, Cu_2, Ag_2, Zn) S + $Bi_2 S_3$ = Alaskaite.

If the zinc be left out of the molecule, the ratio of 1 : 2 is perfect. It may be presumed therefore that the alaskaite is certainly a valid species, and that it occurs with cosalite at the Alaska mine. From the latter species only the lighter gray color distinguishes it, but one must see the two together to notice the difference. The discovery of the cosalite at this mine we owe to Dr. Genth.

Among the specimens, which I received through Mr. Stockder of Lake City, from the "Old Lout" I noticed a very fine granular lead gray mineral which appears mixed with pyrite, chalcopyrite, barite and quartz. I succeeded in getting 1.11 gr. of it in a very fair degree of purity. Its specific gravity, uncorrected, is 6.565. Its composition as follows :

Bi	=	19.35
Pb	=	45.87
Ag	=	9.98
Cu	=	1.12
Fe	=	2.89
S	=	16.39
Insoluble	=	0.12
		95.72

For the loss of 4.3 per cent in this analysis I can at present not account. Iron and copper eliminate themselves as chalcopyrite and pyrite; remain

Bi	=	19.35 : 210	=	0.0930	
Pb	=	45.87 : 206.4	=	0.2216	0.2878
Ag	=	9.98 : 215.3	=	0.0462	
S	=	13.37 : 32	=	0.4180	
R : Bi : S	=	3.09 : 1 : 4.5			

that is 6.18 $(PbAg_2)$ S + Bi_2S_3 = Beegerite.

The original beegerite, crystallized, from Clear Creek county, Colorado, contains no silver at all. Apparently this interesting species, only existing in one specimen heretofore, is not rare at the new locality, and may be procurable to collectors.

I reserve a more satisfactory examination to the future.

University of Pennsylvania, Jan., 1884.

The Remarkable Sun-glows in the Falls of 1883 and 1884.

By Wm. Blasius.

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There has been much speculation by scientists as to the true explanation of those extraordinary sun-glows that astonished the world in November of 1883, and reappeared in a somewhat lesser degree at about the same time in 1884. In the attempt to explain the brilliancy of this phenomenon, some few meteorologists started on that philosophical principle, that it differs from the usual sun-rises and sun-sets only in degree, and not in kind, and that an explanation must be found in the same laws that govern the ordinary phenomena, *i. e.*, in the refraction of the sun's rays in the stratum of moist air that surrounds the earth's surface.

These views found their difficulty in the fact that the atmosphere during the time the extraordinary phenomenon took place was comparatively dry, at any rate, that its moisture did not appear to reach to an altitude sufficiently elevated, to cause the glows to extend to that extraordinary height that they appeared to reach.

To overcome this difficulty, some meteorologists brought the mysterious cyclone into play. The cyclone whirls, so they say, the moist air to an elevation sufficiently high to account for the phenomenon. If the position of the cyclone were such as to allow the sun's rays to pass, in its highest region, through only one side of it; the highest portion of the sun-glows might find a satisfactory explanation; but as it would be difficult for the sun's rays to pass through both sides of the cyclone, the lower portion of the sun-glows seems to be left unaccounted for.

When meteorologists failed to satisfactorily solve the problem, the astronomers took the case in hand, and looked for an adequate cause ex-